

DETAILED ACTION

Specification

1. The amendment filed 4/6/2010 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: on p. 4 of the Amended Specification regarding the ratio defined as the magnetic field and parts [202], [204], [208], [210].

Applicant is required to cancel the new matter in the reply to this Office Action.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a) because they fail to show parts [202], [204], [208], [210] as described in the Amended Specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary,

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the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 5 contains the limitation requiring the substrate has the surface parallel to the opposing surface. It is unclear as to which surface the claim is referencing. For examination purposes, 'said surface' has been interpreted as 'the first surface'.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-5, 9-11, 14, 21-27, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tateishi et al (US Patent No. 4,853,102).

With respect to claims 1 and 21, Tateishi et al discloses a sputtering apparatus comprising a substrate [25] having a first surface and an opposing surface (i.e. backside), a second surface [5] spaced from said first surface and connected to a sputtering power source [20] as a cathode, and a third surface [28] connected to said power source [20] since a means connects said cathode and said anode to generate an electric field (fig. 10; col. 12, lines 39-48). Fig. 10 also depicts a permanent magnet [33] under the substrate [25] for generating a magnetic field [c] as depicted in fig. 8 (col. 11, lines 43-48). Fig. 8 depicts magnets (i.e. permanent magnets [33]) [30] generating a magnetic field axial with said magnets [30] under the substrate [25], with said magnets [30] also generating magnetic field [c] that extends through said substrate [25] and appears to eventually intersect the second surface [5] (col. 10, lines 25-68; col. 11, lines 1-17). Fig. 10 also depicts the gap between the second surface [5] and the first surface of the substrate [25] appears to be over two times greater than a gap between said first surface and the permanent magnets [33], therefore it is obvious to one of ordinary skill that the magnetic field is twice as strong between said permanent magnet [33] and said

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first surface than between said permanent magnet [33] and said second surface [5] due to said magnetic field weakening as a result of the distance said magnetic field travels. Furthermore it has been held that a particular parameter must first be recognized as a result-effective variable, i.e. a variable which achieves a recognized result, before determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. See MPEP 2144.05, Section II, Part B. Therefore one of ordinary skill would find it obvious to shift the second surface [5] closer to or farther from the first surface of the substrate [25] to obtain an optimum magnet field (i.e. two times weaker) at said second surface [5] than at said first surface in order for a magnetic field generated behind said second surface [5] to effectively trap a plasma against said second surface to perform sputtering. Tateishi et al further discloses the electric field is generated between the second surface [5] and the third surface [28], where fig. 10 depicts that said electric field penetrates the plasma (i.e. electron confining region) [27].

With respect to claims 2-3 and 22-23, Tateishi et al further discloses the electric field is generated between the second surface [5] and the third surface [28] are contained within a vacuum chamber [1] (fig. 10; col. 12, lines 41-48), with it obvious that said electric field extends to the substrate [25]. If not, it must be due to a structural claim limitation not currently present.

With respect to claims 4 and 24, Tateishi et al further discloses that the substrate can be rotated (i.e. moving continuously relative to magnetic field) (col. 12, lines 22-25).

With respect to claims 5, 11, and 27, Tateishi et al further depicts in fig. 10 the first surface and opposed surface of the substrate [25], the second surface [5], and the third surface [28] all parallel.

With respect to claims 9 and 25, Tateishi et al further discloses the substrate [25] is biased negatively (col. 11, lines 6-7).

With respect to claims 10 and 26, Tateishi et al further discloses that the substrate [25] can be negatively biased by a DC voltage or high-frequency (i.e. RF) power (col. 2, lines 53-61). Despite Tateishi et al not disclosing that the substrate bias can be AC, one of ordinary skill would find it obvious that the substrate can be biased using AC voltage since there are only three types of power sources, DC, AC, and RF.

With respect to claims 14 and 29, Tateishi et al further discloses in fig. 8 the magnets [30] as being a mirror magnetic field. It is expected that the mirror magnetic field generates a racetrack having a return field passing through the center of said racetrack. If not, it must be due to a structural claim limitation not currently present.

7. Claims 13 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tateishi et al (US Patent No. 4,853,102) as applied to claims 1 and 21 above, and further in view of Kashiwatani et al (JP No. 09241406).

With respect to claims 13 and 28, the reference is cited as discussed for claims 1 and 21. However Tateishi et al is limited in that the substrate comprising a flexible web supported by a conveyor roll is not suggested.

Kashiwatani et al teaches a plasma generating apparatus comprising a vacuum chamber containing a magnet assembly, a substrate voltage bias, a web-like substrate

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having a polymer film supported on a conveyor having rollers (abstract). Kashiwatani et al cites the advantage of the web-like substrate as reducing damage to the substrate, producing good thickness distribution, and enables high-speed formation (abstract).

It would have been obvious to one of ordinary skill in the art to incorporate the web-like substrate supported on the conveyor as taught by Kashiwatani et al in place of the substrate of Tateishi et al to gain the advantages of reducing damage to the substrate, producing good thickness distribution, and enables high-speed formation.

Response to Arguments

Specification

8. The Applicant has amended the Abstract to the proper length; the previous objection is withdrawn.

Drawings

9. The Applicant has amended the Specification to delete reference to nonexistent Fig. 2D; this objection is withdrawn. The Applicant has also provided new Fig. 4 showing part [39] to replace old fig. 4 with the Amended Specification referencing parts [42] and [79]; these previous objections are withdrawn.

Double Patenting Rejection

10. The Applicant filed a Terminal Disclaimer on 4/6/2010, which was approved on 4/15/2010; the rejection is withdrawn

112 Rejection

11. The Applicant has amended claims 1 and 5 to clarify the gap between the first and second surfaces; the previous rejection is withdrawn.

102 Rejections

12. Applicant's arguments with respect to claims 1-5, 9-10, 13-14, and 21-29 have been considered but are moot in view of the new ground(s) of rejection due to the new limitations requiring an opposing surface and a magnetic field axial with said magnetic field source.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Band whose telephone number is (571) 272-9815. The examiner can normally be reached on Mon-Fri, 9am-5pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

15. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. B./

Examiner, Art Unit 1795

/Alexa D. Neckel/

Supervisory Patent Examiner, Art Unit 1795